A FINAL REPORT OF THE SURFACE COLLECTION AND EXCAVATION OF SBr-189 RESEARCH CONDUCTED UNDER ANTIQUITIES ACT PERMIT NO. 79-CA-187

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Prepared for:

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Flood Control District
Public Works Agency
825 E. Third Street
San Bernardino, Ca. 92415

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ABSTRACT

A detailed data recovery program was conducted on December 8th through the 16th of 1979, for the San Bernardino County Flood Control District. The San Bernardino County Flood Control District wished to acquire a right-of-way for the transportation of heavy equipment through a portion of SBr-189 to their construction site on the Mojave River. Field work focused on the proposed right-of-way. The data recovery program included surface collection of 170 units and excavation of 19 test units.

Evidence recovered from SBr-189 indicates that the site is probably not the historic village of Susugina, but a series of temporary seasonal campsites of an earlier period. Cultural remains recovered from SBr-189 have proved significant. The association of an undisturbed, datable, subsurface stratum to an assemblage of cultural remains is an infrequent occurrence in the Mojave Desert.

INTRODUCTION

Between the 8th and 16th of December, 1979, the San Bernardino County Museum Association initiated a program of surface collection and excavation at SBr-189 near Hinkley, California. This project was conducted for the San Bernardino County Flood Control District, under the Antiquities Act Permit No. 79-CA-187.

Recently extensive data collection programs have begun to shape, or reshape, thoughts regarding cultural development along the Mojave River (Drover 1979, Rector 1979). It is hoped that this and future reports on SBr-189 will contribute to the analysis of prehistoric culture development of this region.

I would like to acknowledge the following individuals for their cooperation and advice in the organization of this project and production of this report. Ray MacDonald, San Bernardino County Flood Control District; Dr. Gerald Smith, Director of the San Bernardino County Museum; Bill Olsen, Russell Kaldenberg and Mark Q. Sutton, Archaeologists with the Bureau of Land Management; Dee Simpson, Archaeologist, San Bernardino County Museum, Darrell Duro, Native American Consultant, San Manuel Reservation; N. Nelson Leonard, III, Environmental Analysis Division, San Bernardino County; Art Luther, San Bernardino County Flood Control; Robert Reynolds, San Bernardino County Museum; Christopher Drover, Golden West College; Eric Ritter, and Hyrum Johnson, Desert Planning Staff; Carol Rector, University of California, Riverside; Gail Givens, Bureau of Land Management, Barstow; Ken Shulte, Bureau of Land Management, Barstow; and Betty Duitsman, local informant from the Barstow area.

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PROJECT HISTORY

The San Bernardino County Flood Control District has proposed a project in the Hinkley vicinity to control the flooding of the Mojave River, thereby providing protection to adjoining properties. An access road, which will approximate the route of an existing unimproved road, will be constructed to transport heavy equipment and raw materials to the project site in the current riverbed. This haul road will pass through SBr-189.

SBr-189 was first recorded in 1938 and again in 1963 by Dr. Gerald A. Smith. The site has been visited by local collectors over the years. In 1977, the San Bernardino County Flood Control District requested the San Bernardino County Museum Association to complete a cultural resources assessment of the project area. The project assessment was completed in 1978. Based upon data provided by the Museum Association, the Bureau of Land Management, Barstow Office, constructed a data recovery program designed to assess the nature of cultural remains to be impacted by the proposed haul road (Sutton 1979). The San Bernardino County Museum Association, under the direction of the author, conducted a detailed data recovery program based upon these BLM conditions.

ENVIRONMENT

Geologic:

The great arc of the Mojave River is the dominant geographic feature of the Western Mojave Desert. The numerous mountains and hill groups on both sides of its course are largely isolated from each other by alluvial fill (Bowen, 1953:11). Elevations range from 5200 feet in the Sidewinder and Granite Mountains to 2045 feet at the border of Harper Dry Lake.

The oldest rock groups exposed in the area are believed to be paleozoic, these are the Waterman Gneiss, the Hodge Volcanic series and the Oro Grande series. The Sidewinder Volcanic series of Triassic age overlay the Oro Grande series and Fairview Valley formation. Continental deposits both fluviatile and la custrine known to be of upper Miocene Age occur in widely scattered patches throughout the area. Uplifted and dissected, Upper Pleistocene alluvium, occurs over wide areas. Pleistocene alluvium is found north of Helendale, in conjunction with playa lakebed deposits. Broad areas are covered by recent alluvium, but in some areas only a thin veneer still exists. The site lies north of the Mojave River on the lowest stream terrace, where dune sand has accumulated.

Within the vicinity of the site area are many formations, which could provide raw materials to aboriginal populations. Quaternary basalts are found in the Black Mountain area. This formation includes basalts and some local deposits of scoriaceous tuff. Tertiary sediments found northeast of the Lockhart Fault ranges in age from Miocene to Pliocene. This formation consists of sandstone, limestone, and volcanic tuffs. Tertiary volcanics found in some sections of the Waterman Hills

and Mt. General include felsite, rhyolite, dacite, and andesite. The Basement Complex, also located in the Waterman Hills and Mt. General, is composed of Pre-tertiary Chrystalline and Metamorphic rock. This formation includes light to dark granites and metamorphic rock.

Chalcedony occurs in the Calico Hills, Stoddard Valley and other areas in the vicinity. Cherts are found near Kramer Corners and in the Calico Hills. Quartzite could be acquired from river cobbles or from Quartzite Mountain near Victorville. All resources are within 20 miles of the site area.

Climatic:

The present climate in the Hinkley area is arid to semi-arid, the evaporation rate exceeds the rate of annual rainfall. Snow is known to fall in the area, especially in the low lying foothills and mountains. Winter storms originate in the Pacific; summer and autumn thunderstorms result from the Gulf of California. Maximum summer high temperatures may reach 120 degrees, with winter lows dipping to 10 degrees. Average temperatures are, in January and July, 45 degrees to 85 degrees respectively.

A sequence of significant climatic changes has occurred during the span of human occupation of the Mojave Desert. About 12,000 - 10,000 BP, pluvial lakes began to dry and by 7,500 BP climate conditions were much like the present (Mehringer 1977:113). Ernst Antevs (1948) proposed the term Neothermal to address this post-glacial period. Based upon hypothesized temperature change he further subdivided this period into Anathermal (end of Pleistocene to 7,500 BP), a period of increased warmth; Altathermal (7,500 - 4,000 BP), a period of marked rise in temperature and greater aridity than present; and the Medithermal (4,000 - 2,000 BP) somewhat colder than present. Pollen samples from Fishbone

and Guano Caves in Pershing County, Nevada (Sears and Roosma 1961) reflect these general patterns of climatic change. During the Medithermal there is a rise in grassland pollen at the expense of desert flora just prior to 3250 BP. Desert pollen reasserts itself after 3250 BP Locally, analysis of woodrat middens (King 1976) also illustrate a shift in climate from cool and moist to warmer and drier conditions about 7800 BP. These middens indicate a vegetal depression of from 600 to 800 meters in elevations during Late Wisconsin Glaciation.

Hydrologic:

Surface flow in the Mojave River is influenced by base flow, the discharge of ground water into the stream channel, and storm runoff. Base flow is found at several locations: tributaries within the San Bernardino Mountains, the confluence of the West Fork of the Mojave and Deep Creek, Victorville, Camp Cady and Afton. In the latter three areas rising ground water results from constrictions in the alluvial section of water-bearing materials (Department of Water Resources 1967: 39-40). Winter and Spring snow and rainfall in the San Bernardino Mountains is the principal source or funoff surface flow. Winter and Spring runoff is the sole source of surface water in the vicinity of SBr-189.

Thus the availability of surface water in the site region is seasonal. The majority of surface flow would occur from late December until May. The amount and consistency of flow would be reliant upon the magnitude of precipitation in the San Bernardino Mountains.

Biotic:

The native flora of the site region may be characterized by three plant communities. It is worthwhile to note that changes brought about by man have altered biotic communities in the site region far greater than climatic variation over the last 7500 years.

Three native communities exist: Riparian, Saltbush Scrub, and Cresote Bush Scrub. The Riparian community is marginal. A few Cottonwoods (Populus Fremontii) occur about the margins of the flood plain of the river. This portion of the river is distinct from an area where base flows contribute to lush riparian habitats. Saltbush Scrub occurs in sandy areas on the lowest river terrace. Four-winged Saltbush (Atriplex canescens), Morman Tea (Ephedra californica), Indian Rice Grass (Orozypsis hymenoides), Tumbleweed (Salsola kali) and Mesquite (Prospis juliflora) are common plants to the site area. Creosote Bush Scrub is located away from the river or on higher terraces along the river. Creosote (Larren tridentata) is the dominate shrub.

During the course of archaeological field work in the Western Mojave Desert (Coombs 1978:16) and at Oro Grande (Rector 1979:12) fauna checklists were prepared. These observations may be used to characterize the current fauna of the Hinkley region. Rabbits (Lepus californicus) and (Sylviligus audubonii) were the most frequent mammal. Small rodents, birds, and reptiles were also common. The blacktailed jack rabbit (Lepus californicus) was frequently observed in the SBr-189 area.

CULTURE HISTORY

Man's first appearance in the new world, has created controversy among archaeologists. Advocates of Pleistocene Man in the new world refer to the Calico Site (Simpson 1969, Schuiling 1979) and to the sites around China Lake (Davis 1978). Estimates for the earliest occupation of the Calico site, range to 70,000 BP. Estimates of occupation range from 45,000 to 50,000 BP for sites located around China Lake.

Rogers (1939) referred to early assemblages as Malpais, Kreiger (1962) as pre-projectile point and Simpson (1958, 1960) as the manix Lake Industry. Davis (1978) constructed a chronology of Pleistocene Man about China Lake; Core Tool Tratition (45,000-25,000 BP), Late Wisconsin Culture I (25,000 - 20,000 BP). Late Wisconsin Culture II (20,000 to 15,000 BP) and Proto Clovis Culture (15,000 to 1300 BP).

Many archaeologists agree that man was present by at least 13,000 years ago. There are a number of sites existing with unquestioned radiocarbon dates of this time period. These sites exhibit a well developed tool assemblage which includes projectile points. The following chronology is adapted from Warren and Crabtree (in Press).

LAKE MOJAVE PERIOD (10,000 to 7,000 BP)

During this period populations are adapted to a sub-Pleistocene environment-wetter and cooler conditions than are now present. Lake Mojave period is an element of the Western Pluvial Tradition (Bedwell 1970; Hester 1973), a pattern seen throughout the Great Basin. The focus of occupation is about lake systems. Populations are characterized as small, mobile groups, subsisting primarily through hunting and fowling. Plant resources may have been of secondary importance as food.

The Lake Mojave Assemblage, as defined at Lake Mojave (Warren and Ranere 1968) includes three complexes: San Dieguito, Haskomat and Fluted Points. The San Dieguito complex is a southern California phenomenon. The assemblage is characterized by leaf-shaped points, Lake Mojave points, elongate knives, crescents and scrapers of several types; tool production is crude percussion flaking (Warren 1967). The Haskomat complex is similar to San Dieguito with the exception of the Haskett points. This complex is more characteristic of the northern Great Basin. The Fluted Point Tradition is represented by projectiles occurring as isolated finds or in questionable association with other remains at Lake Mojave.

PINTO PERIOD (7,000 to 4,000 BP)

This period is not very well understood, owing to the lack of definition of the diagnostic tool form - The Pinto Point series. Sites exhibiting these points were first described by Elizabeth and William Campbell (1935); in the same paper Amsden (1935) dated this complex near the close of the Pleistocene, based upon the association of these remains with an ancient river course. Other authors (Harrington 1957; Wallace 1958, 1962) also associated Pinto Points with extinct water resources, though the interpretation is an association with post-pleistocene cyles of heavy rainfall (5000 to 2000 BP).

As the period between 7000 and 4000 BP is recognized as a time of drying, generally dryer conditions than the present (Antevs 1948), several authors have suggested a cultural hiatus or period of scant human population of lower desert elevations. Wallace (1962) indicated a hiatus between 7000 and 5000 BP; Hall and Barker (1975) present a similar occurrence between 8000 and 6000 BP.

Warren and Crabtree (1978) feel that Pinto Culture represents populations still heavily reliant upon hunting. Collection of plant foods, particularly the collection and milling of seeds may have begun towards the end of this period.

GYPSUM PERIOD (4000 to 1500 BP)

Populations during this time period were hunters and gatherers. A wide range of plant foods were exploited, as evidenced by the presence of milling (mano and metate) and pulping (mortar and pestle) tools. Environmental conditions were not significantly different than the present. Diagnostic artifacts include Humboldt Concave. Elko Series and Gypsum Cave projectile points. Incised slate objects and painted pebbles also occurred during the end of this period. Smaller projectile points, at this time, suggest that the bow and arrow were present by 1500 BP.

The advent of the bow and arrow, projectile point styles and the presence of split twig figurines may indicate influences from the southwest.

SARATOGA SPRINGS PERIOD (1500 to 1000 BP)

This is a continuation of the Gypsum Period. Patterns of land use and subsistence remain the same. Rose Springs-Eastgate Series and Cottonwood Triangulars are introduced at this time, as new projectile point forms. A material culture associated with the mining and transport of turquoise in the eastern Mojave is present at this time. Rogers (1929) describes the presence of Basketmaker III and Pueblo pottery in association with the turquoise mining districts. Sigleo (1975) has identified the presence of turquoise from Halloran Springs in rooms dating between 1500 and 1300 BP, at Snaketown, in Arizona.

SHOSHONEAN PERIOD (1000 BP TO HISTORIC CONTACT)

This period is a continuation of the two preceding periods. Basic patterns of subsistence and settlement persist. This time period is marked by the local production of pottery - Owens Valley Brown Ware and the introduction of the Desert Side-Notched arrow point. Cottonwood Triangulars persist, becoming less frequent over time. Prehistoric culture is essentially identical to that described for ethnographic populations of this region.

HISTORIC CONTACT

Fr. Francisco Garces, in 1776, was the first recorded European to travel in the general area of the Mojave River. Garces left the Colorado River near Needles and traveled across the Mojave Desert to San Gabriel Mission during the month of March in 1776. He may not have visited the exact location of this present Mojave River Flood Control Project. On March 16, 1776, he left the watercourse and cut across to again intersect the river near present Helendale. On November 30, 1819, Fr. Joaquin Pascual Nuez, the Chaplain with the Moraga expedition, did visit a rancheria called by the natives Sisugina, near this flood control project. Fr. Nuez recited the Holy Rosary and named Sisugina (which was interpreted as the Rancheria of the Devil) the Rancheria of the Archangel St. Michael.

In the autumn of 1826, Jedediah Strong Smith followed the Old Indian Trail up the Mojave River and probably passed near this flood control project location. Following Smith came many other Rocky Mountain Men, Traders from Santa Fe, New Mexico, and Mormon Pioneers from Utah. No specific mention is made of an Indian village at the present proposed site of this flood control project.

To evaluate the impacts of the proposed flood control project and assess the importance of SBr-189, the area was surface collected and tested by excavation.

A baseline was laid out in the approximate center of the existing haul road. Inasmuch as the road was not mapped on the 1-inch = 200-ft. scale maps of the project vicinity supplied by the Flood Control District, the northern most transit station on the baseline was tied into local landmark, depicted on Flood Control District maps. All units were constructed about the baseline. The right-of-way of the haul road and 10 meters to the east and west of the margins of the road were collected (Map III). A single unit comprised the road right-of-way. The east/west extent of these units was variable; the width of right-of-way ranged from 9.3 meters to 16.5 meters. The variable width of the road created a staggered effect. As the road was not straight, the baseline included three angles. At these points, unit overlap occurred on the inside of the angle. These areas were bagged separately so materials could be attributed to both units. All units were numbered from south to north and designated with respect to their relationship to the right-of-way (i.e. 20 - 20 r/w of 10 - 20 east of r/w). Units began at the current flood plain of the Mojave River and continued north until the site boundary was bypassed.

Surface collection units were measured from the baseline. A right angle was created by measuring from the closest established right angle to the baseline. A crew member estimated the edge of the right-of-way (edge of disturbance) and a stake was driven at that point. The northern line was created first. Once the northern line had been

established for the unit within the right-of-way, the distance of the stakes which would form the northeast and northwest corners was measured. These measurements were noted on the bag for the unit and in the field notes. These measurements would vary from unit to unit, as did the position of the baseline within the unit. The measurements for the northern line were then duplicated to form the southern line. Once stakes were present at each corner the adjacent 10 x 10 meter units were constructed by extending the north and south lines 10 meters to the east and west. Units were strung at the time of collection. The labor force was organized into three, two-person crews, one crew constructed units, the other crew recorded and collected surface phenomena.

After a unit was constructed, notes were taken regarding surface condition, all materials visible on the surface were then collected. Tools, manufacturing waste, food remains and fire-affected rock were retained. All bags were labeled: unit, date, depth and collectors. All collection was accomplished by hand. The surface was not scraped or brushed. One hundred seventy surface collection units were examined on about 1.75 hectares of the site area exhibiting cultural remains. Not all possible units were collected; heavily disturbed units were excluded from the sample.

Two areas of cultural remains were defined by surface collection units (Map IV). As nearly all areas lacking remains also lacked dune build-up, it was expected that sub-surface deposits would most likely be located in areas exhibiting a combination of sand dunes and surface remains. A total of nineteen 1 x 1-meter units were excavated; all but 5 of these were located in areas displaying surface remains. Fourteen of the units in areas of cultural remains were clustered in a relatively

small area to explore the extent and complexity of a sub-surface deposit. Units were placed adjacent to the haul road right-of-way in areas that had not been significantly affected by recent cultural disturbances. One unit was placed in the haul road right-of-way.

Excavation units were located and labeled relative to surface collection units (Map III). All units were back staked and oriented north/south east/west. The northwest corner was used as datum plane. Units were excavated in 10 centimeter levels by trowel. Soil was passed through 1/8-inch screen. The range of remains enumerated for the surface collection were retained at this stage also.

Excavation continued until no further cultural remains were encountered. Post hole excavation was instituted in each unit to insure that buried deposits were not overlooked. All units were backfilled to the original surface contour.

Samples were taken for analysis of soil, carbon, and floral remains. Soil profiles were drawn in stratified areas.

Cultural remains were washed and cataloged. The accession number, SBCM-14, was assigned by the San Bernardino County Museum. This number was followed by successive numerals (SBCM-14-7) which tied into a description of provenience and character of the object in the catalogue. Following this preliminary processing all remains were analyzed and described (see Description of Artifactual Remains and Tables I-VIIB).

Remains were initially grouped into the following categories: tools, manufacturing waste, faunal remains, flotation sample, fire-affected rock, and radiocarbon samples. Tools were described by size, material, method of production type of wear, extent of wear, and traits related to the function of a tools type (i.e. weight of hammers, or edge angle of scrapers).

The faunal analysis was performed by Debbie Beckley, Comparative Osteologist with the San Bernardino County Museum, with the help from Mark Norell, Comparative Osteologist-Herpetologist, Cal State Long Beach.

The identifications were made with the aid of a comparative skeletal collection composed of recent animals. Identifiable specimens were compared to those in the collection until one was found whose skeletal element matched that of the specimen in question. Also taken into consideration was the range and habitat of the animal. The minimum number of individuals represented was determined by counting the skeletal elements identified and calculating how many of each element a single individual might have.

Large mammals were identified as any creatures fox size and up. All other bone was considered to be small mammal. Burnt bone was determined primarily by color, ranging from white to blue-gray and black. Other bone was various shades of brown and tan except to recent bone which was off white.

A total of 20 samples was collected during excavation for flotation analysis. These samples were collected in columns from side walls of 150-160E Unit #1, from the west wall and from 140-150E Unit #3, from the south wall. All samples were processed after returning from the field.

Samples were poured slowly into large basins that allowed the water to circulate when filled to desired level. One millimeter screen collected all particles larger than one millimeter suspended on or near the surface. No carbonized seeds were recovered from the sample.

Fire affected rock was quantified according to weight, size, and material. Size and material were ascertained in a manner identical to the analysis of flakes.

Ten carbon samples were collected from the habitation area.

These samples were taken from a 30-centimeter thick level of charcoal concentration. These samples were removed by trowel and wrapped in aluminum foil to prevent contamination. Three samples of 10 grams each were sent to the Center for Applied Isotope Studies, University of Georgia, Athens, Georgia. Remaining samples are stored at the San Bernardino County Museum.

SITE DESCRIPTION

SB4-189 is located within a large complex of sand dunes on the north side of the Mojave River near Hinkley, California. The legal description of the site location is as follows:

> Northeast 1/4 of Section 11, Northwest 1/4 of Section 12, Township 9 North, Range 3 West, San Bernardino Base Meridian.

The universal transmercator grid coordinates are:

Northwest corner. $^{4}85540E$, $^{38}60840N$; Northeastern corner - $^{4}86530E$, $^{38}60930$; Southwestern Corner - $^{4}85270E$, $^{38}60180$, and Southeastern Corner - $^{4}86275E$, $^{33}60540N$.

The site is bounded on the south by the Mojave River and on the north by agricultural fields. The west and east are delineated by relatively open, flat, sandy terrain. A dirt road, a southern extension of Summerset Road, bisects the site area. This road approximates the proposed haul road right-of-way.

SBr-189 includes roughly 60 hectares. Approximately 6.5 hectares actually display surface remains (Map II). Cultural remains are not continuous. Cultural materials are exposed on the surface in deflated areas. Surface clusters range in size from 2 hectares to 150 square meters. The cultural assemblage, included metates, manos, hammerstones, projectile points, knives, scrapers, potsherd, faunal remains, thermal fractured rock and flaking detritus.

Natural erosion, wind activity, has disturbed much of the site. Approximately 5% of the surface area has been impacted by human disturbances, dumping of trash, construction of dirt access road and building structures. Years of collecting by local artifact hunters has undoubtedly, resulted in removal of selective categories of artifacts: projectiles, knives, pottery objects and ornaments.

The soil of the site is fine windblown sand. Differential compaction appeared to be a direct result of moisture content. Test excavations suggest that intact sub-surface deposits exist within the site area. A 30 - 40 centimeter thick cultural level was encountered 40 centimeters below the surface. The first ten to twenty centimeters of sand was very loose, so loose it was not possible to maintain vertical sidewalls in the excavation units. Soil yielding cultural remains ranged from light tan to light gray depending on the intensity and type of occupation, and the degree to which that occupation had been disturbed by natural agencies. Soil stratified below levels containing cultural remains tended to be yellowish brown sand. The greatest depth of cultural deposit was 80 centimeters. Rodent disturbances occurred at all levels.

A well-defined stratum of dark gray soil was encountered in units 140-150R, 140-150E, and 150-160E. This stratum ranged in thickness from 18 to 40 centimeters (Figure I). It contained concentrations of charcoal, lenses of ash, and significant increases in quantity of cultural remains.

DESCRIPTION OF ARTIFACTUAL REMAINS

A total of 3713 prehistoric remains was recovered. These have been divided into four major categories: tools (128), manufacturing waste (391), faunal remains (2206), and fire-affected rock (988). Tools have been further divided by material, means of production, form, and use. Manufacturing waste is divided into cores and flakes.

TOOLS

HAMMERS

These tools are formed from blocks, cobbles, cobble fragments, and other rock forms. The raw materials for these tools are meta-volcanic (6), quartzite (6), chalcedony (2), and quartz monzonite (1). Tools range in size from 8.9 x 8.2 x 6.9 centimeters, weighing 765 grams to 6.6 x 5.6 x 6.9 centimeters, weighing 157.2 grams. Tool outline is sub-rectangular (blocky) to circular; cross-sections are sub-rectangular, ovate, and plano-convex (Plate 6 A-E).

Use is exemplified by pitting and step-flaking which create a crushed or battered area of wear and by one example of abrading which produces a ground surface. The extent of wear ranges from 10% to less than 1% of the surface area of the tool. Three specimens are fire affected. Eight whole and seven fragmentary specimens were recovered. Each of the whole tools is described in Table I.

MANOS

These tools are made from cobbles of quartz monzonite, basalt, and meta-volcanic rock. They range in size from tools measuring 12.5 x 10.0 x 5.4 centimeters to 8.3 x 6.7 x 4.3 centimeters. The outline of these tools is ovate and irregular; they are sub-rectangular, ovate, sub-triangular, and plano-convex in cross section. The majority exhibit

bifacial wear; 5 of the 8 whole specimens and 13 of the 14 fragments, for which this trait could be ascertained, exhibited bifacial wear.

Eight of the 13 grinding surfaces represented in the sample of 7 whole tools exhibited well-developed surfaces created by use (abrasion) and maintenance (pecking). The majority of complete surfaces exhibited a flat profile with a beveled margin (Plate 7 D-F). Eight exhibited this profile, three a flat profile with no bevel, and three displayed a slightly rounded grinding surface. Nineteen fragments possessed sufficient grinding area to determine profile of the surface. Thirteen were flat (no distinction was made between flat and flat with beveled margin) and six were slightly rounded.

Shaping other than through use and maintenance, occurred on 5 of the 8 whole specimens. These tools exhibited pecking, grinding, and pecking and grinding of the tools shoulders. Of the 10 fragments for which a determination could be made, 7 exhibited shaping.

Sixty-two percent (5 of 8) of whole manos were fire affected. Eighty-four percent (27 of 33) of fragmentary manos were fire affected. Whole manos are described in detail in Table II.

METATES

These tools are made from relatively flat boulders of basalt (4) schist (3), and meta-volcanic (18) rock. All specimens were fragments. From the examples present it appears these tools were relatively thin; the maximum thickness of most would fall between 4.5 and 6.5 centimeters. Seven fragments contributed to observations regarding shaping, modification apart from use and maintenance of grinding surfaces. Three fragments exhibited shaping-pecking or flaking of the margins (shoulders).

All fragments exhibited relatively flat or shallow basin grinding surfaces. Eleven fragments were of sufficient size to determine the

number of grinding surfaces per tool. Three were unifacial, eight exhibited bifacial use. Seven of the twenty-five fragments were fire affected; these tended to be the smaller fragments.

No whole specimens were recovered; twenty-five fragments exist.

SHAPED TABULAR STONE

A fragment of an unidentified artifact form was recovered. It measures 4.9 x 4.6 x 1.1 centimeters,and it is made of vesicular basalt (Plate 6-E). The thickness of this fragment is uniform. Surfaces have been shaped by pecking and grinding. The fragment is trapizoidal in outline and sub-rectangular in cross section. The outline of the complete form may have been trapizoidal or triangular. This fragment is fire affected.

UNIDENTIFIABLE GROUND STONE

These fragmentary artifacts exhibited ground surfaces. However, there was insufficient evidence to distinguish mano from metate fragments. Eleven of the eighteen specimens were fire affected.

PROJECTILE POINTS/KNIVES

A. These artifacts are symmetrical, bifacially flaked forms. The entire periphery of the tool exhibits flaking. The total surface area displays flake scars. Only blade element fragments were recovered: two tips and one mid-section. All are made of chalcedony. These elements are triangular in outline and lenticular in cross section (Plate 4 A and C).

Flaking near the tip causes the point to be either slightly assymetrical (Plate 4 B) or slightly constricted (Plate 4 A), a characteristic which may be limited to Elko Series projectile points, in the Mojave Desert.

B. These artifacts are bifacially flaked forms. The two fragments

suggest tools with roughly ovate outlines, possessing irregular cross-sections. These forms exhibit flake scars over much of the surface; however, flaking is irregular. Both examples are made of chalcedony.

REAMERS

These tools are manufactured from chalcedony flakes. They range in size from 3.7 x 1.2 centimeters to 5.7 x 2.8 x 1.2 centimeters. Two of the three examples exhibit at least one edge which has been modified to reduce the thickness of the flake to form the bit element. Modification by shaping and use results in steep edge angle. (70 to 90 degrees). Modified edges exhibit numerous, small step-flake removals (Plate 4 D-F).

The bit element is triangular in profile and cross section; at least two of the three converging edges exhibit shaping and/or use. Seven of eight utilized edges exhibit unifacial wear. The bit element ranges in length from 1.6 to 3.5 centimeters. The shape of the bore element is irregular. This element is not shaped.

Three whole examples and one base fragment were recovered.

SCRAPERS

These forms exhibit unifacial shaping and/or utilization. These artifacts are divided into sub-types based upon tool dimensions, edge angle, and degree of edge modification.

A. These are large tool forms exhibiting straight, steep angle (70 to 90 degrees) working edges (Plate 7 A-C). Flakes of quartzite, chalcedony, and meta-volcanic rock, and a quartzite block are raw materials.

The four tools exhibit six working edges; all but one exhibits shaping and utilization.

B. These forms are relatively small. They are made from chalcedony flakes. All utilized edges exhibit shaping. One tool exhibits two concave working edges; the edge angles are 50 degrees. The second tool exhibited four edges, each straight. The edge angles range from 75 to 90 degrees (Plates A, B and F).

C. The tools within this category are of variable size; the factor that distinguishes this group is the lack of shaping or sharpening of the utilized edges (Plate 5 C-E)

Five tool forms are made from flakes - three of chalcedony - two of meta-volcanic rock. These five tools exhibit six working edges - five straight and one convex. The edge angle range from 30 to 50 degrees for straight edges, and 70 degrees for the single convex edge.

CHOPPERS

These are relatively large tools made from chalcedony cores or blocks. Two examples were recovered. One measures 10.1 x 6.5 x 4.2 centimeters, with a worked edge 6 centimeters in length; the second measures 8.9 x 5.7 x 3.7 centimeters with a worked edge 5 centimeters in length. These forms are characterized by bifacially flaked working edges. Wear consists of discontinuous, minute step flakes. Heavy use results in crushed appearance.

MULTIPURPOSE TOOL

This single specimen exhibits three worked or utilized areas. These are formed on a small chalcedony flake. Dimensions of this tool are 2.3 x 1.3 x 0.5 centimeters. The first working edge is a straight, chisel-shaped prominence formed by flaking two converging edges. The width of the prominence is 0.2 centimeters; the second edge exhibits

bifacial flaking; the length of this straight edge is 1.1 centimeters. The third edge exhibits a continuous series of minute flakes (no apparent shaping). The profile of this edge is convex; the edge angle is 70 degrees.

UNFINISHED TOOL

A single flake of chalcedony exhibiting flaking along two edges was recovered. These worked edges are terminated by broken edges. As the shaped edges do not exhibit wear this form has been categorized as a tool broken in production.

FIRED CLAY

A single pot sherd was recovered from the excavation. This specimen measured 0.5 x 0.3 x 0.3 centimeters. It is brown in color with sand temper.

A second example of fired clay was recorded. This is an amorphous lump, at least five smaller lumps pressed together, which have been fired (baked?) at low temperatures. This specimen measures 2.4 x 1.5 x 1.2 centimeters.

CORES

These artifacts are the residue of flake production. They are blocks of chalcedony (3) and meta-volcanic (1) rock. These forms range in size from 7.2 x 4.2 x 3.2 centimeters to 5.7 x 3.4 x 2.7 centimeters.

FLAKES

These relatively thin, angular artifacts are for the most part products of pressure flaking. Raw materials and size of these 387 specimens are quantified in Tables VA and VB. Seventy-six percent of these artifacts would pass through 1 centimeter mesh. Raw materials

include chalcedony, chert, obsidian, meta-volcanic, basalt, rhyolite, quartz, and quartzite. The majority of these forms are made of chalcedony (65%).

FAUNAL REMAINS

A total of 2206 pieces of highly fragmented bone were collected. The majority (2143 pieces) of these remains were retrieved from the sub-surface sample. Burnt bone represents a relatively small portion of the collection (173 pieces). One hundred twenty-six fragments were identifiable, the majority of these were black-tailed jackrabbit (Lepus californicus). Table VI describes all identifiable specimens. The range of animals present, and minimum number of individuals is as follows:

REPTILIA

Ophida

Viperidae

Crotalus Rattlesnake (1)

Lacertilla

Iquanidae

Crotaphytus sp. Collared Lizard (1)

Phrynosoma sp. Horned Lizard (1)

Unidentified sp. Lizard (1)

AVES

Falconiformes

Accipitridae sp. Hawk (1)

Unidentified sp. small (1)

Unidentified egg shell fragments

MAMMALIA

Lagamorpha

Leporidae

Sylvilagus sp.	Cotton tail	(1)
Lepus sp.	Jack Rabbit	(7)

Rodentia

Neotoma sp.	Woodrat	(1)
Spermophilus sp.	Ground Squirrel	(3)

Geomyidae

Thomomys sp.	Gopher	(1)

Heteromyidae

Perognathus sp.	Pocket Mouse	(1)

Carnivora

Canidae sp.

Unidentified	Coyote or dog	(1)
Canis Lantrans	Coyote	(1)
Vulpes macrotis	Kit Fox	(1)

Artiodactyla

Antilocapridae

Antilocapra americana	Pronghorn	(1)

FIRE AFFECTED ROCK

Fire affected rock was quantified by size and material, 988 specimens were recovered. Tables III A and B describe these remains. Over 98% of the raw material were meta-volcanic, granite, or quartzite. The most popular material was quartzite which comprised 61% of the sample.

All of the above specimens were unmodified, excepting for exposure

to fire or heat. Broken or discarded tools, particularly milling tools, were also utilized in the construction of rock features. Sixty-two percent of whole manos, 84% of mano fragments, 28% of metate fragments, and 61% of unidentifiable ground stone fragments were fire affected.

DISCUSSION

A total of 127, ten centimeter levels were excavated; 12.7 cubic meters of soil were examined. The number and type of cultural remains are summarized in Table VIII; these distributions may be found in Tables IX and X.

Two classes of tools are directly associated with food gathering or processing; milling tools, and knives and projectiles. Milling tools - manos, metates and unidentified ground stone - comprise the majority (66%) of total tool forms from SBr-189. They are associated with the processing of hard seeds. Native plants in the site vicinity which produce seeds, commonly thought to be processed by milling tools, are Indian Rice Grass and Saltbush. Seeds would be available from late spring to early summer.

The possibility the mesquite bean was also processed with mano and metate should not be overlooked. Ethnographic data indicate southern California populations processed dry mesquite beans with mortars and pestles. Reliance on models of food preparation based totally on ethnographic practices is limiting. The use of ethnographic analogy to interpret prehistoric behavior has been justly criticized (Binford 1967). Of primary importance is the question - Would milling tools be effective in reducing beans to a useable form? Rather than the appearance of mortars and pestles heralding the use of mesquite, they may indicate a refinement in the processing of this food source.

A limited number of projectiles and knives were recovered. Type A may all be fragments of darts; at least two are probably Elko projectile points. Both forms described under the heading of type B are knife fragments. Projectile points and knives, suggest the hunting and butchering of large mammals, and butchering of small animals.

Faunal remains also alert to hunting activities. The general lack of large land mammal bone correlates with the limited number of projectiles. Rabbit, in particular black-tailed jack rabbit, is the most frequent animal in the faunal assemblage (making up 92% of identifiable bone). Rabbit may be captured throughout the year. All animals represented by the faunal assemblage could have been acquired from the immediate vicinity of the site.

No intact hearths, ovens, or other features were recorded. Fire-affected rock components of such features were present in varying quantity. Field stone and fragmented tools were utilized in the construction of rock features.Several pieces of granitic rock exhibited fire coring, indicative of heating in a reducing atmosphere.

Maintenance and production activities were represented by a number of tools and manufacturing waste. Hammers, comprising 12% of the tool assemblage, were the most frequent tool not directly associated with food acquisition or processing. Despite the general lack of abraded surfaces (only one hammer out of eight whole specimens) hammers may be associated with the maintenance of milling surfaces.

The use of hard materials (quartz monzonite, meta-volcanics, and quartzite) for both milling tools and hammers may influence wear produced on hammers used to rough grinding surfaces. The characteristic abrading wear on hammers used for this purpose may be associated with maintenance of milling tools made of predominately softer material (schist and sandstones).

A wide range of scraping tools were recovered. Type A are large flakes exhibiting steep edge angles. Utilized edges are wide, straight, and display heavy use. The steepness of edge angle and size of tool suggest scraping or planing of hard materials such as wood. Smaller flake scrapers and utilized flakes exhibit varying edge angles and shapes;

they were probably associated with the working of a variety of materials.

Four reamers were present; these tools were utilized to bore and/or enlarge holes. They may be associated with the working of wood. Other tools associated with production are choppers.

Four cores and 387 flakes comprise waste from the manufacture and maintenance of flaked stone tools. The majority of flakes are small (76% would pass through 1 centimeter mesh), broad and thin. This suggests finishing and reworking of relatively small tools - projectile points, knives, and small scrapers. As discussed previously, the dominate flaking technique was soft hammer and pressure flaking.

Chipped stone tools and manufacturing waste are predominantly chalcedony and chert. These materials could have been acquired from several sources within 20 miles of SBr-189. Chalcedony and chert from the Calico Hills and Kramer Hills regions are undoubtedly present. Basalt and meta-volcanic rocks may be acquired from the Black Mountain region. Quartz and quartzite occur as cobbles in the flood plain of the Mojave River. The only raw material that could not be acquired locally is obsidian. Twelve flakes of this material were recovered. Pilot Knob is the nearest source for obsidian.

The cultural assemblage and available resources of the immediate site area would suggest seasonal occupation during late spring or summer. Milling appears to be the dominate activity. Habitation was not brief, as a wide range of maintenance and manufacturing tools are present. This suggests a relatively sedentary occupation during the seed collecting season. Surface flow of the Mojave River rarely extends to this season today. Slightly wetter conditions may alter this.

Dating of occupation at SBr-189 is heavily dependent upon three radiocarbon samples from the buried component. These samples and the

results of analysis are as follows:

UGa-3344	Unit 150-160 E	3210 ± 105 BP
	#1, 60-70 cm.	(1260 BC)
UGa-3345	Unit 150-160E	3295 ± 80 BP
	#1, 55-65 cm.	(1345 BC)
UGa-3346	Unit 150-160E	3025 ± 75 BP
	#1, 50-60 cm.	(1075 BC)

These dates place the sub-surface deposit in the region of units 140-150 R, 140-150 E and 150-160 E in the early phase of the Gypsum Period. These three dates are tightly clustered. Given the span of time included by the Sigma factor, these dates could fall within 100 years of each other. If these dates are representative, then the sub-surface deposit was created over a relatively short period of time, some 3100 - 3200 years ago.

Two and possibly a third tool may be classified as projectile points. Despite the fragmentary nature of these forms the shaping of the tip of the two more complete specimens suggest they may be assigned to the Elko Series. Both represent relatively large projectiles. As Elko Series projectile points decrease in size over time, these projectile points may be assigned a date between 4000 and 2000 BP. The larger of these points was recovered from the sub-surface deposit. The other was found on the surface.

The only remaining time sensitive artifact is a single piece of pottery. This fragment was too small to identify specifically. The earliest occurrence of pottery in the Western Mojave is trade wares dating between 1500 - 1300 BP. Due to the infrequent occurrence of early wares, it is likely that the single sherd recovered is a later ware,

dating to the Shoshonean Period (1000 to 200 BP). This artifact was recovered from the 0 - 10 centimeter level of an excavation unit.

Stratigraphy is the final means to assess temporal relationship at SBr-189. Clearly natural agencies have caused a great deal of mixing of occupation components. However, one well-defined and a second possible sub-surface component exists in an undisturbed state. Test units 140-150R, 140-140 E, and 150-160 E, located an intact sub-surface deposit. This cultural level may cover an area of some 150 square meters.

The radiocarbon dates described previously date this stratum. This level is earlier than materials recovered from the surface of this area. As sand can rapidly build up or deflate, the 20 to 60 centimeters of sand which separate the surface assemblage from the buried deposit could represent essentially contemporary occupation or occupation dating within the last 200 to 300 years. The single pot sherd was recovered from this area, indicating a component of the occupation remains stratified above the dated cultural level at least 2000 years later in time.

Test unit 440-450 #1 also located cultural remains sub-surface. However, the lack of an associated soil discoloration and lens of ash or charcoal suggest these remains may have been affected by wind erosion.

Because of the unstable nature of sand dunes, it is likely that the full range of site occupation is exposed on the site surface. Surface associations cannot be assumed to be contemporary. The general lack of sensitive artifacts (projectiles, knives, pottery, and ornaments) on the surface may be in part explained by the activities of local collectors. However, if a substantial Shoshonean Period occupation were present evidence, small pot sherds or fragments of small projectile points, would have been found in greater quantity. Thus, it is suspected that the

majority of occupation at SBr-189 predates the Shoshonean Period.

The presence of milling tools and the fact that they are the dominant tool form from SBr-189, and in particular the dated stratum, is significant. Descriptions of cultures dating 3000 years before present either do not include milling activity (Wallace 1977) or state milling tools are not present in large numbers (Warren and Crabtree 1978). Wallace is so certain of a hunting orientation for the early phase of Mescuite Flat Culture (5000-3000 BP), he dismisses the presence of milling tools at one site by saying, "But almost certainly they were left behind by later visitors." (Wallace 1977: p 117). Wallace describes no milling activity, though he recognizes the introduction of the mortar and pestle, for the later phase of Mesquite Flat Culture (3500-2000 BP).

While Wallace's chronology was constructed to describe the culture history of Death Valley, he (Wallace 1962) and others (Rogers 1945, and Warren and Crabtree 1978) agree that milling tools were either not present or only present in small quantities prior to 2000 BP. The excavated assemblage from Newberry Cave would tend to support the lack of emphasis on milling (Smith 1963). However, Smith felt that this assemblage represented a specialized activity area, associated with ritual. Current re-evaluations of this assemblage (Davis, 1980) tends to support this.

This lack of recognition of milling activities has resulted from the reliance on projectile points as time indicators, the lack of many radiocarbon dates and the character of sites in the Mojave Desert, usually surface sites or materials in sand dunes. Chronologies have been based on surface assemblages and rock shelter excavations for the most part. Surface assemblages are suspect with regards to association of components and rock shelter habitations may represent only a selective segment of the year-round activities of a population.

The presence of a well-defined stratum containing a preponderence of milling tools and dating 3200 BP is significant. Descriptions of Gypsum Period culture should be modified to include seed collecting and processing activities.

CONCLUSIONS

The adverse impacts of the proposed San Bernardino County Flood Control project at the Mojave River near Hinkley, California, has now been mitigated to a level of non-significance. This investigation completed the required mitigation and the use of a haul road across a portion of Bureau of Land Management land will not now have a significant adverse impact on cultural resources.

Important additional information pertaining to our understanding of human pre-historic use of the desert lands has been obtained.

Artifacts recovered from this study have been catalogued and placed in the San Bernardino County Museum for Curation.

Like most research projects, this investigation provides recommendations for further research in the general area of the project site. These recommendations which will be discussed in the following pages, should in no way delay approval of the proposed flood control project.

RECOMMENDATIONS FOR FURTHER RESEARCH

Field work has yielded several important results. This investigation produced no evidence to suggest SBr-189 was a proto-historic historic village. Sutton (1979) and others had thought this could be the location of Sisugina. While data collection, was limited for the most part, to the haul road right-of-way and a 10-meter wide corridor on either side of this, the lack of Shoshonean Period time markers was significant. Cursory review of the total site area also failed to locate artifacts indicating post 1000 AD occupation. Excavation along the right-of-way located and tested an intact sub-surface stratum dating 3000 BP. The presence of this deposit represents an opportunity to acquire an assemblage of cultural remains from a relatively short period of occupation.

It is likely that other intact sub-surface deposits exist elsewhere within the total scope of SBr-189. A site wide sub-surface sampling project is necessary to ascertain the history of occupation. From cursory reconnaissance it appeared that there are several areas exhibiting surface characteristics similar to collection units 140-150E and 150-160E. These areas are exemplified by low dunes of loose fine sand. Cultural remains in varying density are present on the surface. Test excavations should be placed in slightly elevated areas exhibiting relatively low yield of cultural remains, directly adjacent to slightly depressed areas of high surface yield. The probability of recovering datable remains (carbon or ash) or time sensitive artifacts is high.

A sample of 10 loci across the site area would allow for an accurate description of site complexity. The level of field work would not be prohibitive: two man days to locate units, four man days to more

accurately map the location and extent of surface remains, and about 30 man days to excavate twenty 1 x 1 meter units. Significant analysis costs would be incurred, however. Assuming two to three radio-carbon samples from each excavation area, the project would have to support the cost of 25 radiocarbon dates. Analysis of tools, manufacturing waste and fire affected rock would not require a large amount of capital. Faunal analysis costs would be low, as the amount of identifiable bone is low.

A second productive project would be the excavation of the known sub-surface deposit. Test units have provided sufficient information to determine the extent and complexity of the deposit (Map 3).

At least 25% of this deposit should be sampled. The best method allowing the greatest flexibility for expansion of the sample size, would be to excavate a two-meter trench parallel to the road right-of-way (roughly north/south). The trench should include the total area of suspected deposit. A trench 1 to 3 meters east of the western boundary of surface units 140-150E, 150-160E would be 25 meters in length.

The trench should be back-staked at one meter intervals to preserve 1 x 2 meter units of observation. Each unit would be excavated in 10 centimeter levels and cultural levels, where possible. To facilitate the use of cultural levels, excavation should begin in the area where sub-surface deposit is best delineated, adjacent to test unit 150-160 #1.

Successive trenches could be constructed parallel to the initial trench, or if only a limited amount of additional work is feasible. a single trench perpendicular to the initial excavation. The south wall of this 2-meter wide trench would adjoin the north walls of test units 150-160 #1,3,4.

Excavation of this sandy soil proceeds rapidly. Laying out and

excavation of the initial trench (2 x 25 meters) would consume about 50 man days. Analysis time and costs would be variable. Five to six additional C 14 samples should be submitted for age determination. Analysis of the tools and manufacturing waste would not require a substantial amount of time. Faunal and flora analysis may require considerable time, depending on the size of the sample and how much of the sample is identifiable.

Excavation would result in an assemblage of cultural remains from a datable context. Analysis to date suggests this assemblage represents a relatively short period of occupation, about 3000 years old. Test excavation found no evidence of mixing of remains from a later period of occupation. Additional work is very likely to locate intact features (hearths and/or ovens) which will yield additional radiocarbon samples. Such features may also yield floral remains. Analysis and reporting of these remains would provide the first body of descriptive data for a well-defined occupation, dating from the earlier phase of the Gypsum Period in the Western Mojave Desert.

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TABLE I

HAMMERS

ACC. #	NAME OF RAW MATERIAL	% OF SURFACE EXHIBITING USE	TYPE OF WEAR	SHAPE OF WORN SURFACE	WEIGHT	TOOL DIMENSIONS
- 266	Chalcedony Core	5%	Step-Flaking	Rounded & Angular	157.2 grams	6.6 x 5.6 x 4.2 cm
- 213	Meta-Volcanic Cobble Fragment	1%	Same	Angular	252.2 grams	6.8 x 5.7 x 4.5 cm
- 45	Quartz Monzonite Mano Fragment	5%	Step-Flaking & Pitting	Rounded	468.8 grams	8.3 x 7.4 x 4.6 cm
- 268	Meta-Volcanic Cobble	10%	Step-Flaking & Pitting & Abrading	Rounded & Flat	372.3 grams	7.8 x 6.7 x 5.5 cm
- 44	Course-grain Volcanic Cobble Fragment	2%	Step-Flaking & Pitting	Predominately Angular, Lesser Area Rounded	276.8 grams	8.2 x 7.3 x 3.1 cm
- 135	Meta-Volcanic Block	5%	Same	Predominately Angular, Lesser area Rounded	325.1 grams	8.4 x 7.0 x 4.6 cm
- 277	Quartzite Cobble	Less than 1%	Pitting	Rounded	Over 600 grams	8.9 x 8.2 x 6.9 cm
- 293	Same	Same	Step-Flaking & Pitting	Angular	325.5 grams	7.1 x 6.5 x 3.5 cm

TABLE II

MANOS

ACC. #	MATERIAL	TOOL DIMENSION	SHAPING OTHER THAN TRANSFER USE	SIZE OF GRINDING SURFACE	PROFILE OF GRINDING SURFACE
- 262/-132	Basalt Cobble	9.5 x 8.4 x 4.4 cm	Localized Pecking on shoulder	7.3 x 6.0 cm	Flat with beveled margin
				8.0 x 7.2 cm	Flat with beveled margin
- 220	Quartz Monzonite Cobble	9.4 x 7.9 x 3.6 cm	Localized Pecking on shoulder	6.7 x 6.7 cm	Flat with beveled margin
				6.5 x 6.5 cm	Slightly Round
- 186	Quartz Monzonite Cobble	11.0 x 9.6 x 4.9 cm	Extensive Pecking Localized Grinding on Shoulders	8.4 x 9.0 cm	Flat with beveled margin
				9.0 x 9.0 cm	Flat with beveled margin
- 198	Quartz Monzonite Cobble	10.4 x 8.8 x 5.4 cm	Grinding on Shoulders	7.6 x 8.3 cm	Flat with beveled margin
				6.5 x 7.6 cm	Flat with beveled margin
- 282	Quartz Monzonite Cobble	8.4 x 5.9 x 6.4 cm	None	3.3 x 5.0 cm	Flat
- 143	Quartzite Cobble	9.4 x 5.7 x 5.3 cm	None	4.0 x 6.5 cm	Flat
- 219	Meta-Volcanic Cobble	12.5 x 10.0 x 5.4 cm	Pecking and Grinding on Shoulders	9.4 x 10.5 cm	Flat with beveled margin
				9.2 x 10.7 cm	Slightly Round
- 2	Quartzite Monzonite Cobble	8.3 x 6.7 x 4.3 cm	None	3.0 x 5.0 cm	

TABLE III

REAMERS

ACC. #	MATERIAL	TOOL DIMENSIONS	LENGTH OF BIT	MAXIMUM WIDTH OF BIT AT TIP	MAXIMUM WIDTH OF BIT AT BASE
- 15	Chalcedony	3.7 x 3.1 x 2.2 cm	1.6 cm	0.2 cm	1.6 cm
- 119	Chalcedony	5.7 x 2.8 x 1.2 cm	3.5 cm	0.3 cm	2.1 cm
- 29	Chalcedony	3.9 x 1.6 x 1.4 cm	2.6 cm	0.1 cm	1.4 cm

TABLE IV

SCRAPERS

ACC. #	MATERIAL	TOOL DIMENSIONS	LENGTH OF UTILIZED EDGE	PROFILE OF UTILIZED EDGE	EDGE ANGLE	EDGE MODIFICATION
A.						
- 10	Quartzite Block	10.2x6.9x4.3 cm	4.0 cm	Straight	80 deg.	Continuous Large Step Flakes, Continuous Minute Flakes
			5.1 cm	Straight	90 deg.	Series of Minute Step-Flake Clusters
			6.0	Straight	90 deg.	Continuous Large Step Flakes, Continuous Minute Flakes
- 133	Chalcedony Flake	12.6 x 10.5 x 3.4 cm	4.4 cm	Straight	80-90 deg.	Continuous Flakes, Cluster of Minute Step-Flakes
- 11	Quartzite Flake	12.1 x 8.0 x 4.1 cm	8.0 cm	Straight	90 deg.	Continuous Large Step-Flakes, Continuous Minute Step-Flakes
- 134	Meta-Volcanic Flake	10.7 x 7.7 x 4.9 cm	5.3 cm	Straight	70-80 deg.	One Large Flake, Continuous Step-Flakes, Continuous Minute Step-Flakes
B.						
- 315	Chalcedony Flake	2.6 x 2.9 x 1.1 cm	1.2 cm	Concave	50 deg.	Two Large Flakes, Series of Minute Flakes
			0.6 cm	Concave	50 deg.	One Large Flake, Series of Minute Flakes
- 56	Chalcedony Flake	3.1 x 3.2 x 0.9 cm	2.5 cm	Convex	50 deg.	Continuous Flakes, Edges Rounded by Weathering
- 32	Chalcedony Flake	2.9 x 2.0 x 1.8 cm	0.9 cm	Straight	80 deg.	Two Step Flakes, Continuous Minute Step- Flakes
			0.3	Straight	75 deg.	Series of Flakes, Continuous Minute Step-Flakes

TABLE IV - CONTINUED

SCRAPERS

ACC. #	MATERIAL	TOOL DIMENSIONS	LENGTH OF UTILIZED EDGE	PROFILE OF UTILIZED EDGE	EDGE ANGLE	EDGE MODIFICATION
			0.9	Straight	70 - 80 deg.	Two Large Flakes, Continuou Minute Step-Flakes
			0.7	Straight	90 deg.	Two Step-Flakes, Continuous Minute Step-Flakes.
- 312	Chalcedony Flake	4.5 x 2.7 x 0.4 cm	2.2	Straight	40 deg.	Continuous Minute Flakes
- 72	Chalcedony Flake	2.3 x 1.7 x 0.6 cm	1.6	Straight	50 deg.	Continuous Minute Flakes
- 73	Chalcedony Flake	2.4 x 2.8 x 0.7 cm	1.3	Straight	30 deg.	Continuous Minute Flakes
			0.6	Straight	30 deg.	Continuous Minute Flakes
- 48	Meta-Volcanic Flake	6.1 x 5.7 x 2.7 cm	1.5 cm	Straight	50 deg.	Discontinuous Minute Flakes
- 275	Meta-Volcanic Flake	6.3 x 5.9 x 2.2 cm	4.0 cm	Convex	70 deg.	Series of Minute Flakes

TABLE V A

FLAKES

SURFACE

	CHALCEDONY	META-VOLCANIC	OBSIDIAN	CHERT	BASALT	RHYOLITE	QUARTZ	QUARTZITE	
< 50 MM	30	02	01	06	01		01	03	44
> 50 < 1 CM	84	03		15			01	04	107
> 1 CM < 2 M	31	10		07	04	01	01	02	56
> 2 CM < 4 CM	05	02		01	02			06	16
> 4 CM									00
	150	17	01	29	07	01	03	15	223

TABLE V B

EXCAVATION

	CHALCEDONY	META-VOLCANIC	OBSIDIAN	CHERT	BASALT	RHYOLITE	QUARTZ	QUARTZITE	
< 50 MM	70	07	10	05	02	02	02	07	105
> 50 < 1 CM	23		01	04	02	01		06	37
> 1 CM ≤ 2 CM	05	01		02	03	01		02	04
> 2 CM < 4 CM	03						01	04	08
> 4 CM									00
	101	08	11	11	07	04	03	19	164

TABLE VI APPENDIX

Cat. No.	Unit No.	Depth	No. Bone Frag.	Wt. Grms.	No. Brnt. Frag.	Specimen	Element	
SBCM-14-207	140-150E	Surface	8	1.3	1	Antelocapra americana	acetabulum fragment	burnt
SBCM-14-141	140-150E #1	70-80 cm	23	.9	12	Lepus cf. californicus	lower jaw fragment	
SBCM-14-154	140-150E	00-10 cm	03	.28	01			
SBCM-14-171	140-150E #2	00-10 cm	01	.1	0			
SBCM-14-147	140-150E #2	10-20 cm	02	.02	01			
SBCM-14-175	140-150E #2	20-30 cm	04	.2	0			
SBCM-14-163	140-150E #2	30-40 cm	18	1.26	6	Lepus cf. californicus	rear 2nd phalange	
						Lepus cf. caliofornicus	upper jaw fragment	
						Sylvilagus cf. audobonii	rt 3rd metatarsal	
SBCM-14-161	140-150E #2	40-50 cm	136	5.14	19	1 snail shell fragment		
						Canis Latrans	LP^{1}	well worn adult
						Lepus cf. californicus	left calcaneum	
						Lepus cf. californicus	left prox. radius (2)	
SBCM-14-190	140-150E #2	50-60 cm	115	4.1	10	Lepus cf. californicus	left prox. radius	
						Lepus cf. californicus	rt. condyloid process	burnt
						Lepus cf. californicus	lower jaw fragment	
						Phrynosoma sp.	lower jaw	
						Iguanid sp.	vertebrae	

TABLE VI APPENDIX CONTINUED

Cat. No.	Unit No.	Depth	No. Bone Frag.	Wt. Grms.	No. Brnt. Frag.	Specimen	Element	Comments
SBCM-14-196	140-150E # 2	60-70 cm	125	4.0	4	Lepus cf. californicus	teeth (2)	
						Lepus cf. californicus	left 3rd metatarsal	
						Lepus cf. californicus	left condyloid process	
SBCM-14-93	140-150E #3	10-20 cm	5	.2	2	Lepus cf. californicus	distal phalange	
SBCM-14-79	140-150E #3	20-30 cm	4	.15	0			
SBCM-14-87	140-150E #3	30-40 cm	11	.85	2			
SBCM-14-95	140-150E #3	40-50 cm	2	.3	0	Lepus cf. californicus	rt. distal humerus	
SBCM-14-81	140-150E #3	50-60 cm	2	-	0			
SBCM-14-90	140-150E #3	60-70 cm	14	.65	2			
SBCM-14-289	150-160E #1	50-60 cm	95	9.93	1	2 egg shell fragments		
						Lepus cf. californicus	proximal phalange	
						Lepus cf. californicus	lower jaw fragment	
						Lepus cf. californicus	teeth (2)	
						Lepus cf. californicus	rt. lower jaw fragment	
SBCM-14-178	140-150E #4	10-20 cm	4	.19	0			
SBCM-14-174	140-150E #4	20-30 cm	12	.41	0			
SBCM-14-195	140-150E #4	30-40 cm	24	.81	0			
SBCM-14-185	140-150E #4	40-50 cm	11	.31	2	1 egg shell fragment		
SBCM-14-231	140-150E #5	0-10 cm	47	2.43	3	Lepus cf. californicus	distal phalange	
						Lepus cf. californicus	tooth fragment	

TABLE VI APPENDIX CONTINUED

Cat. No.	Unit No.	Depth	No. Bone Frag.	Wt. Grms.	No. Brnt. Frag.	Specimen	Element	Comments
						Lepus cf. californicus	right premaxilary	
SBCM-14-229	140-150E #5	40-50 cm	12	.6	1	Lepus cf. californicus	left distal radius	
SBCM-14-223	140-150E #5	60-70 cm	93	5.7	2	Lepus cf. californicus	premaxilary	
						Lepus cf. californicus	3rd phalange	
						Lepus cf. californicus	teeth (3)	
						Lepus cf. californicus	upper incisor	
						Falconiformes sp.	phalange	moderate size 12 - 15"
SBCM-14-204	140-150E #5	80-90 cm	15	.6	0	Lepus cf. californicus	rt. condyloid process	
						Spermophilus cf. beechyii	rt. 4th metacarpal	
SBCM-14-26	150-160E #5	60-70 cm	65	2.7	3	Lepus cf. californicus	frnt. distal metapodial	
						1 snail shell fragment		
SBCM-14-192	150-160E #1	50-60 cm	55	2.7	3	Lepus cf. californicus	upper incisor (3)	
						Lepus cf. californicus	tooth	
						Lepus cf. californicus	left astragulus	
						Neotoma sp.	lower jaw fragment	
						cf. Crotaphytus	premaxilary	
SBCM-14-193	150-160E #1	50-60 cm	73	3.51	15	1 snail shell		
						Lepus cf. californicus	left proximal radius	
						Lepus cf. californicus	incisor	
						Lepus cf. californicus	metapodial epiphesis	
						Crotalus sp.	vertebrae	
SBCM-14-205	150-160E #1	60-70 cm	128	8.6	07	Lepus cf. californicus	teeth fragments (5)	
						Lepus cf. californicus	lt. condyloid process	

TABLE VI APPENDIX CONTINUED

Cat. No.	Unit No.	Depth	No. Bone Frag.	Wt. Grms.	No. Brnt. Frag.	Specimen	Element	Comments
						Lepus cf. californicus	sternebrae	
						Lepus cf. californicus	dist. humerus fragment	
						Perognathus sp.	proximal femur	
						Sylvilagus cf. audobonii	lower jaw fragment	
						Thomomys cf. bottae	palate	
SBCM-14-247	150-160E #4	50-60 cm	105	4.45	3	Lepus cf. californicus	2nd phalange	
						Lepus cf. californicus	3rd phalange	
						Lepus cf. californicus	teeth (2)	
						Lepus cf. californicus	jaw fragment	
						Lepus cf. californicus	rt. 3rd prox. metatarsal	
						Sylvilagus cf. audobonii	lt. prox. radius	immatur
SBCM-14-224	150-160E #4	60-70 cm	41	1.9	11	Lepus cf. californicus	zygomatic arch	
						Lepus cf. californicus	2nd phalange	
						Lepus cf. californicus	jaw fragment	
						Lepus cf. californicus	jaw fragment	
						2 egg shell fragments		
SBCM-14-226	150-160E	60-70 cm	140	4.34	6	Lepus cf. californicus	lt. prox. radius (2)	
						Spermophilus cf.tereticaudus	rt. dist. tibia	Very worn adult
SBCM-14-152	150-160E	30-40 cm	11	.42	1	Canid sp.	Pl.	Bigger than fox, smaller than coyote, maybe dog
SBCM-14-42	180-190E	surface	4	.29	0	Lepus californicus	left navicular	recent
SBCM-14-56	180-190W	surface	1	.1	0	Lepus Californicus	tooth	recent
SBCM-14-130	230-240E	surface	31	2.35	1	Lepus californicus	left astragulus	recent

TABLE VI APPENDIX CONTINUED

Cat. No.	Unit No.	Depth	No. Bone Frag.	Wt. Grms.	No. Brnt. Frag.	Specimen	Element	Comments
						Lepus californicus	distal metapoidal	recent
						Lepus californicus	distal phalange	recent
						AVES	phalange	approx. 12" bird
SBCM-14-108	240-250E	surface	6	.3	4			
SBCM-14-120	290-300E	surface	1	.09	1			
SBCM-14-151	370-380E	surface	5	.8	3	*Lepus* cf. *californicus*	left pelvis fragment	burnt
						Lepus cf. *californicus*	right 3rd metatarsal	
SBCM-14-148	380-390E	surface	2	.12	1			
SBCM-14-150	420-430W	0-10 cm	13	.4	0	1 small fragment		
SBCM-14-103	440-450 #1	0-10 cm	1	1.3	0			
SBCM-14-179	150-160E #1	70-80 cm	89	4.08	10	*Lepus* cf. *californicus*	lower jaw fragment	possibly burnt
SBCM-14-183	150-160E #1	80-90 cm	27	.8	0	*Lepus* cf. *californicus*	lt. 4th prox. metatarsal	
SBCM-14-180	150-160E #1	90-100 cm	12	.52	2	*Neotoma* cf. *Lepida*	left 3rd metatarsal	
						Spermophilus cf. *tereticaudus*	left dist tibia	
SBCM-14-84	150-160E #2	0-10 cm	4	.2	0			
SBCM-14-98	150-160E #2	70-80 cm	21	.7	5			
SBCM-14-97	150-160E #2	80-90 cm	31	.94	5	*Vulpes macrotis*	proximal 3rd phalange	
SBCM-14-114	150-160E #3	10-20 cm	3	.02	0			

TABLE VI APPENDIX CONTINUED

Cat. No.	Unit No.	Depth	No. Bone Frag.	Wt. Grms.	No. Brnt. Frag.	Specimen	Element	Comments
SBCM-14-234	150-160E #3	40-50 cm	112	2.8	0	7 egg shell fragments Lepus cf. californicus premaxilary Lepus cf. californicus left proximal radius Lepus cf. californicus teeth (2) Lepus cf. californicus rt. prox. scapula fragment		
SBCM-14-239	150-160E #3	60-70 cm	187	6.75	7	3 egg shell fragments Lepus cf. californicus pelvis fragment Lepus cf. californicus rt. condyloid process Lepus cf. californicus distal femur fragment Lepus cf. californicus teeth (2)		
SBCM-14-188	150-160E #3	70-80 cm	135	4.3	8	Lepus cf. californicus rt. distal humerus Lepus cf. californicus left lower incisor Lepus cf. californicus upper incisor		burnt
SBCM-14-243	150-160E #4	10-20 cm	16	.6	1			
SBCM-14-244	150-169E #4	30-40 cm	14	.5	2			
SBCM-14-246	150-160E #4	40-50 cm	87	3.8	7	3 egg shell fragments Lepus cf. californicus premaxilary Lepus cf. californicus upper incisor (3) Lepus cf. californicus teeth (2) Lepus cf. californicus left prox radius Lepus cf. californicus jaw fragment		

FIRE AFFECTED ROCK TABLE VII A

SURFACE

	META-VOLCANIC	GRANITE	QUARTZITE	BASALT	
< 2 CM	31	36	102	03	172
> 2 < 3	69	27	157	03	256
> 3 < 4	69	20	149	02	240
> 4 < 5	18	12	63	02	95
> 5	06	04	32	00	42
	193	99	503	10	805

FIRE AFFECTED ROCK TABLE VII B

EXCAVATION

	META-VOLCANIC	GRANITIC	QUARTZITE	BASALT	
				1*	
< 2	21	16	34	01	72
> 2 < 3	11	06	28	00	45
> 3 < 4	13	06	22	01	42
> 4 < 5	05	01	09	00	15
> 5	01	01	07	00	09
	51	30	100	*Rhyolite 1 Basalt 1	183

TABLE VIII SUMMARY OF CULTURAL REMAINS

	Surface	Excavation	Total
TOOLS			
Hammers			
Whole	8	0	8
Fragments	7	0	7
Manos			
Whole	3	5 (4)*	8
Fragments	27	6 (2)*	33
Metates			
Fragments	16	9 (7)*	25
Shaped Tabular			
Stone	0	1 (1)*	1
Unidentified			
Ground Stone	16	2 (0)*	18
Projectiles and/or Knives			
A.	2	1 (1)*	3
B.	2	0	2
Reamers			
Whole	2	1 (1)*	3
Fragments	1	0	1

TABLE VIII : Summary of cultural remains

Scrapers			
A.			
Whole	4	0	4
Fragments	1	0	1
B.	2	1 (0)*	3
C.	5	0	5
Choppers	2	0	2

	Surface	Excavation	Total
Multi-purpose			
Tool	0	1 (0)*	1
Unfinished Tool	1	0	1
Fired clay			
Pot sherd	0	1 (0)*	1
Lump	1		1
		Sub-total	128
MANUFACTURING WASTE			
Coves	3	1 (0)*	4
Flakes	223	164 (112)*	387
Faunal Remains	28	2143 (1936)*	2171
Fire-affected rock	805	183 ( )	988
		Total	3678

* Indicates cultural remains from sub-surface deposit units 140-150 R, 140-150 E, and 150 - 160 E.

TABLE IX

SURFACE TOTALS

UNIT	FIRE AFFECT #	FIRE AFFECT WT	FLAKES	ARTIFACTS	BONE
0-10 W					
0-10 R					
0-10 E					
10-20 W					
10-20 R					
10-20 E					
20-30 W					
20-30 R					
20-30 E			1		
30-40 W					
30-40 R					
30-40 E					
40-50 W			1	1 Scraper	
40-50 R					
40-50 E					
50-60 W					
50-60 R					
50-60 E					
60-70 W					
60-70 R					
60-70 E					
70-80 W					
70-80 R					
70-80 E					
80-90 W				1 Hammer Frag.	
80-90 R					
80-90 E					
90-100 E				1 Scraper	
90-100 R					

TABLE IX CONTINUED

SURFACE TOTALS

UNIT	FIRE AFFECT #	WT	FLAKES	ARTIFACTS	BONE
90-100 W					
100-110 E		115 grms.			
100-110 R	1	31 grms.	1		
100-110 W	1	186 grms.			
100-120 E	51	1492 grms.	4	1 Hammer Frag.	
110-120 R				1 Projectile	
110-120 W	97	5035 grms.	2		
120-130 E	1	74.5 grms.		1 Metate Frag. 5 Mano Frag.	
120-130 R			2	Unidentified Ground Stone	
120-130 W	1	68 grms.	1	1 Metate Frag.	
130-140 R	8	1221 grms.	5	1 Scraper, 1 Metate Frag, 1 Mano Frag.	
130-140 W	55	2383 grms.			
130-140 E	4	276 grms.		1 Metate Frag. 1 Hammer	
140-150 R	3	296 grms.	5	2 Mano Frags. 1 Knife, 1 Metate, 1 Hammer, 1 Unidentified Ground Stone	
140-150 W	32	2051 grms.			
140-150 E	4	276 grms.	41	Fired Clay Lump	
150-160 E	30	1865 grms.	5	1 Reamer. 1 Hammer	
150-160 R	23	1632 grms.	3	3 Metate. 5 Mano Frags.	
150-160 W	12	1192 grms.	17		
160-170 E	12	1119 grms.	9	1 Hammer Frag. 1 Metate Frag, 1 Unidentified Ground Stone	
160-170 R	10	3739 grms.	5	1 Scraper, 1 Projectile, 1 Mano	
160-170 W	29	2235 grms.			
170-180 W	4	180 grms.	10		
170-180 R	34	1865 grms.	7	1 Mano	
170-180 E			4	1 Chopper	

TABLE IX CONTINUED

SURFACE TOTALS

UNIT	FIRE AFFECT. #	WT	FLAKES	ARTIFACTS	BONE
180-190 E	1	42 grms.	4		5
180-190 R	20	1492 grms.	8		
180-190 W	2	129 grms.	22	1 Scraper	
190-200 E					
190-200 R		559 grms.		1 Scraper, 1 Unidentified Ground Stone	
190-200 W	1	39 grms.	8	2 Scrapers	
200-210 E	3	195 grms.	2		
200-210 R					
200-210 W					
210-220 E					
210-220 R	4	625 grms.			
210-220 W					
220-230 E					
220-230 R					
220-230 W	2	860 grms.			
230-240 E	23	1790 grms.	20	1 Hammer, 2 Scrapers, 1 Core	
230-240 R	3	3679 grms.		2 Unidentified Ground Stone, 1 Metate Frag.	
230-240 W				1 Hammer, 2 Unidentified Ground Stone	
240-250 E	7	746 grms.	3		6
240-250 R					
240-250 W	3	373 grms.	2		
250-260 E	1	19.5 grms.			
250-260 R					
250-260 W					
260-270 E			1		
260-270 R					
260-270 W					

TABLE IX CONTINUED

SURFACE TOTALS

UNIT	FIRE AFFECT #	FIRE AFFECT WT	FLAKES	ARTIFACTS	BONE
270-280 E					
270-280 R					
270-280 W					
280-290 E					
280-290 R					
280-290 W					
290-300 E					
290-300 R					
290-300 W	1	186 grms.			
300-310 E					
300-310 R					
300-310 W					
300-320 E					
310-320 R	1	76 grms.			
310-320 W					
320-330 E					
320-330 R			1		
32-330 W					
330-340 E					
330-340 R					
330-340 W			2		
340-350 E			1	1 Reamer	
340-350 R					
340-350 W					
350-360 E					
350-360 R	1	64 grms.			
350-360 W					

TABLE IX CONTINUED

SURFACE TOTALS

UNIT	FIRE AFFECT #	WT	FLAKES	ARTIFACTS	BONE
360-370 E					
360-370 R					
360-370 W					
370-380 E					5
370-380 R					
370-380 W					
380-390 E					2
380-390 R					
380-390 W					
390-400 E					
390-400 R					
390-400 W				1 Metate Frag.	
400-410 E					
400-410 R					
400-410 W	1	225 grms.		1 Reamer Frag. 1 Scraper, 1 Knife	
410-420 E					
410-420 R	1	38.5 grms.			
410-420 W		314 grms.	3	2 Mano Frags.	
420-430 E					
420-430 R					
420-430 W	6	171 grms.		1 Hammer	
430-440 E					
430-440 R					
430-440 W	14	559 grms.	2		
440-450 E	2	98 grms.			
440-450 R	6	381 grms.			
440-450 W					

TABLE IX CONTINUED

SURFACE TOTALS

UNIT	FIRE AFFECT #	WT	FLAKES	ARTIFACTS	BONE
450-460 E					
450-460 R	6	363 grms.			
450-460 W	2	1119 grms.			
460-470 E	1	9 grms.			
460-470 R					
460-470 R	2	401 grms.			
470-480 E					
470-480 R					
470-480 W					
480-490 E	2	186 grms.			
480-490 R					
480-490 W		746 grms.			
490-500 E					
490-500 R					
490-500 W					
500-510 E					
500-510 R					
500-510 W					
510-520 E					
510-520 R					
510-520 W					

UNITS FROM 520-600 WERE DEVOID OF ALL CULTURAL REMAINS.

UNIT	FIRE #	AFFECT WT	FLAKES	ARTIFACTS	BONE
Special Collection Unit 145-155	153	19,769 grms.	15	2 Hammers, 3 Unidentifiable Ground Stone, 6 Metate Frags, 1 Scraper, 1 Hammer, 12 Mano Frags, 2 Hammer Frags, 1 Core	

EXCAVATION

TABLE II

	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80	
20-30 E #1									
20-30 W #1									
130-140 E #1	3 bones 15 flakes	15 grms.					1 flake	23 bones	
140-150 E #1									
#2	1 bone 2 flakes	2 bones 5 flakes	4 bones 2 flakes	18 bones 1 flake 9 grams	136 bones 10 flakes	115 bones 2 flakes 173 grams	125 bones 570 grams	1 flake	
#3		5 bones 3 flakes	1 Unidtfyd. Stone, 4 bones, 2 flakes	11 bones 15 flakes	2 bones 11 flakes 502 grms.	2 bones 3 flakes	14 bones 4 flakes		
140-150 R #4	1 Metate frag. 1210 grms.	4 bones 3 flakes 171 grms.	24 bones 2 flakes	1 proj. pt., 11 bones	7 flakes				
#5	1 mano frag. 47 bones 1 flake 24 grms.	1 multi-purp., 337 grms.			12 bones 577 grms.	11 flakes 247 grms.	2 manos, 2 metate frags, 93 bones, 11 flakes, 93 grms.	170 grms.	15 bones, 9 flakes, 7 grms. 80-90
150-160 E #1	1 flake	1 flake	1 scraper, (B) 1 core, 2 flakes	68 grms.		1 mano, 1 mano frag., 1 metate frag, 55 bones	1 metate frag, 73 bones, 334 grms.	89 bones + 128 bones	27 bones 1 flake
#2	4 bones 2 flakes						1 reamer, shaped tab, 7 flakes, 746 grms.	21 bones	31 bone 1 flake 110 grms.

EXCAVATION

TABLE X

		0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80
150-160 E	#4	435 grms.*			14 bones 1 flake 109 grms.*	87 bones	105 bones	181 bones 5 flakes	
	#5	—	1 metate frag.					65 bones	
150-160 W	#1	560 grms.*	24.5 grms.*						
160-170 E	#1								
390-400 W	#1								
420-430 W	#1	13 bones 1 flake							
420-430 W	#1								
440-450 W	#1	1 bone 3082 grms.*	1 mano, 2 mano frags.		163 grms.*	2 flakes 66 grms.*	1 mano frag., 1 Unident. Stone 5 flakes, 364 grms. *		
440-450 W	#2	5 grms. *							

*Grams of fire-affected rock.

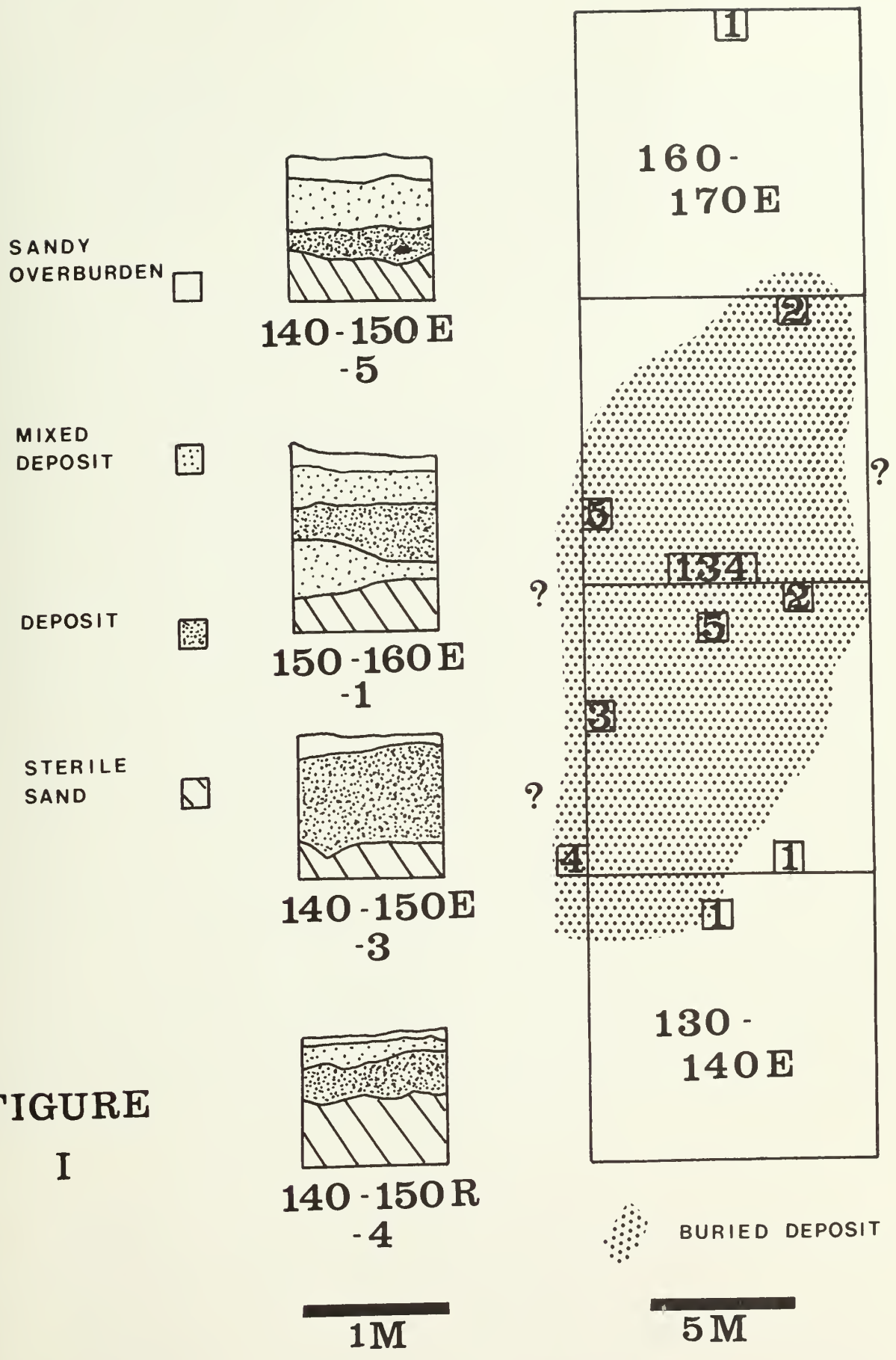

SANDY OVERBURDEN
MIXED DEPOSIT
DEPOSIT
STERILE SAND
140-150E -5
150-160E -1
140-150E -3
140-150R -4
1M
160-170E
130-140E
1
2
5
134
2
5
3
4
1
1
?
?
?
BURIED DEPOSIT
5M

FIGURE I

Aerial Map indicating
Archaeological Site.

PLATE 1

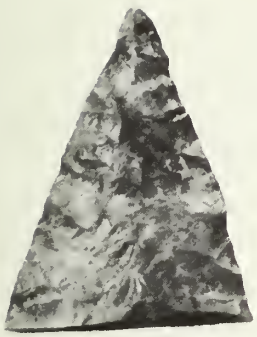
Photograph 1: View to the Northeast setting up the baseline.

Photo 2: View to the north setting up the collection units.

Photograph 3: Overview of site area, looking southwest. Excavation in progress in the east side of right of way.

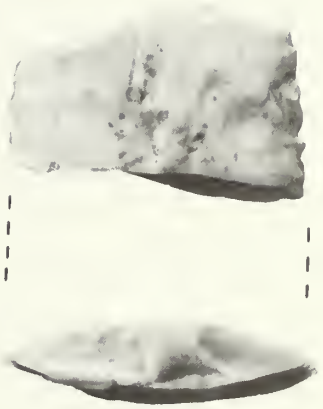
Photograph 4: Excavation unit indicates problems encountered while excavating in sand.

PLATE 4 : A and B are the more complete projectiles, believed to be Elko Series; C mid- section of projectile or knife, cross section shown; D,Eand F are reamers.



A

B



C

D

E

F

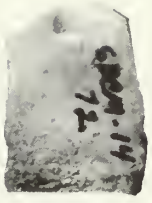
PLATE 4

1 cm.

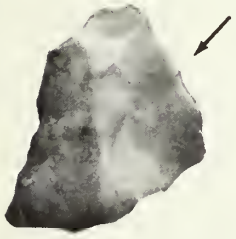
PLATE 5 : A. is lateral and dorsal view of small Type B scraper; B. is a Type B scraper, concave are exhibits use; C,D, and E are utilized flake, utilization occurs on lateral edges; F. is a Type B scraper

A

B



D

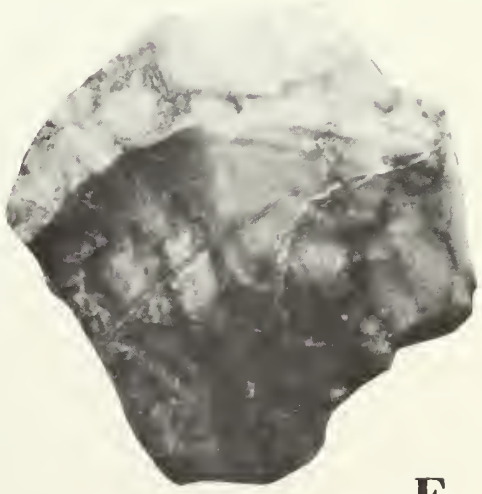


C

E

1 cm.

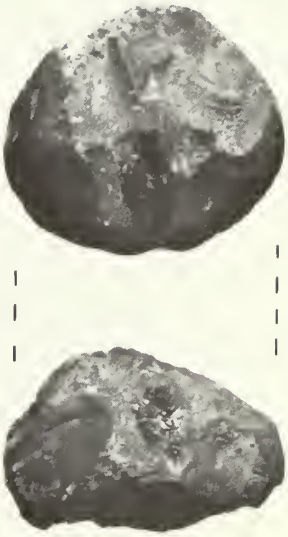
PLATE 5



F

PLATE 6 : A. is a hammer, discolored area indicates battering; B. is a hammer, two views of same specimen; C . is a hammer, flat surface is remnant of ground surface; D. is a mano with irregular ourline; E. is tabular object.

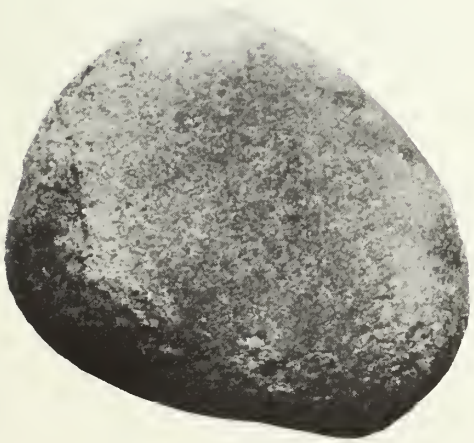
A



B

C

1 cm.



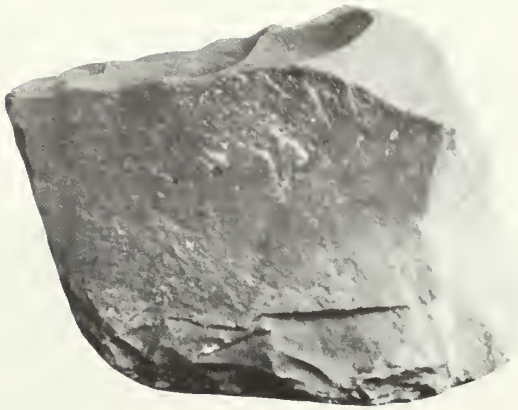
D

E

1 cm.

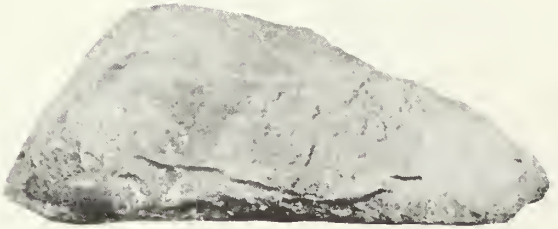
PLATE 6

PLATE 7: A is Type A Scraper, B. is dorsal view of same specimen (arrow indicates area of heavy use); C. is a second example of a Type A Scraper; D,E,and F. are views of a single mano (arrow indicates bevel on ground surface).



A

B



C

1 cm.

D

E

F

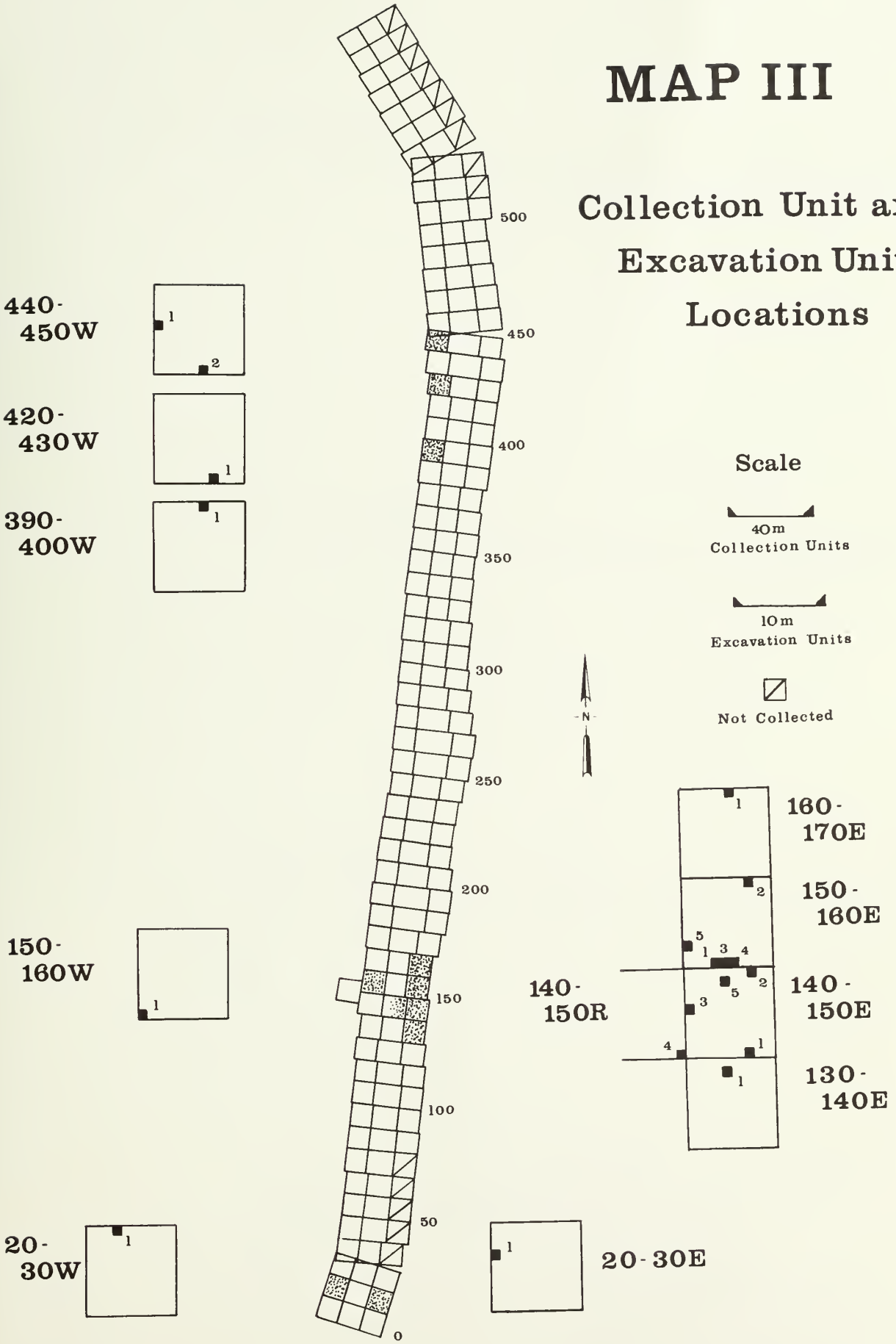
PLATE 7

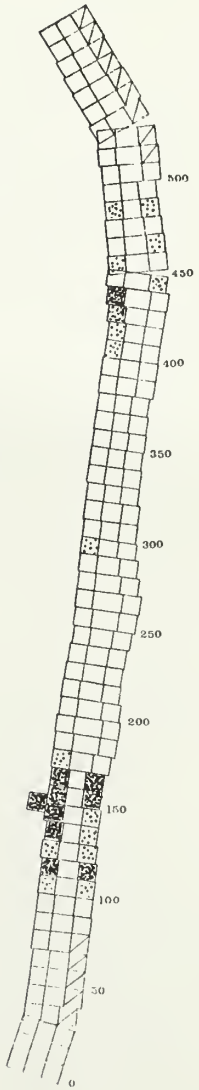
MAP 1
SITE VICINITY
20 Kilometers
EDWARDS AIR FORCE BASE
ROGERS LAKE
MOJAVE
MARINE CORPS BASE
TWENTYNINE PALMS


MAP II
Site Area
SURFACE REMAINS
80 METERS
N
MOJAVE
RIVER
SURFACE COLLECTION TRANSECT
2200
2210
10
00
20

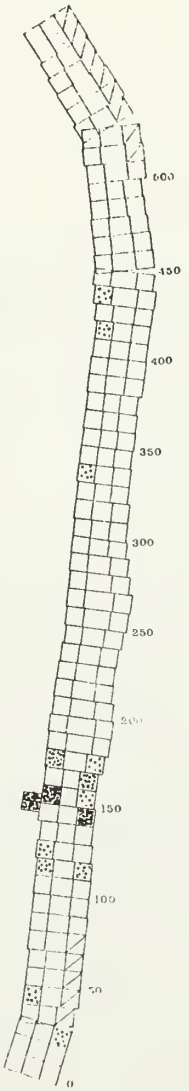
MAP III

Collection Unit and Excavation Unit Locations

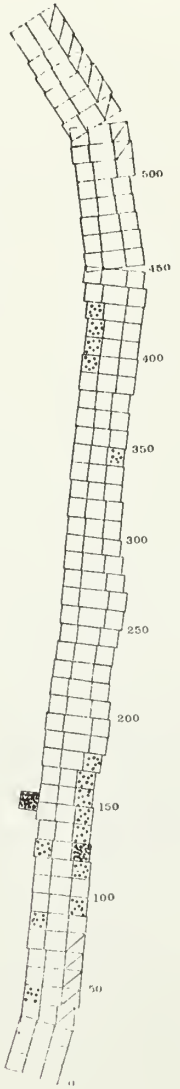




Fire-Affected Rock



Flakes



Tools

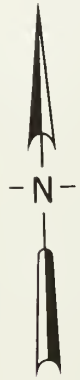
1 - 5

6 - 10

11 -

30m

Right - of - way
Units not shown



MAP IV Distribution of Surface Remains